CLAIMS

I claim:

1. A method for identifying clusters of fail bits in a bitmap, comprising:

(a) finding an available fail bit in a bitmap, and adding said available fail bit to a cluster list;

(b) finding a first set of available fail bits individually within a prespecified distance from said available fail bit, and adding said first set of available fail bits to said cluster list; and

(c) finding additional sets of available fail bits individually within said prespecified distance from individual of said first set of available fail bits or individual of said additional sets of available fail bits, and adding said additional sets of available fail bits to said cluster list so as to identify a cluster of fail bits in said bitmap.

2. The method according to claim 1, wherein (a) comprises finding a fail bit that has not already been added to said cluster list.

3. The method according to claim 1, wherein (b) comprises finding a first set of available fail bits that individually have not already been added to said cluster list.

4. The method according to claim 1, wherein (b) and (c) are not performed if an available fail bit cannot be found in (a).

5. The method according to claim 1, further comprising repeating (a) through (c) multiple times to identify multiple clusters of fail bits in said bitmap.

6. The method according to claim 5, wherein (a) comprises finding a fail bit that has not already been added to said cluster list.

7. The method according to claim 5, wherein (b) comprises finding a first set of available fail bits that individually have not already been added to said cluster list.

8. The method according to claim 5, wherein (c) comprises finding additional sets of available fail bits that individually have not already been added to cluster lists identifying said multiple clusters of fail bits in said bitmap.

9. The method according to claim 5, wherein processing of said bitmap is terminated if an available fail bit cannot be found in (a).

10. The method according to claim 1, wherein (b) further comprises setting a flag associated with said available fail bit to indicate a first state.

11. The method according to claim 10, wherein (b) further comprises resetting said flag so as to indicate a second state after finding all of said first set of available fail bits.

12. The method according to claim 10, wherein (b) comprises:

(b1) finding another available fail bit within said prespecified distance from said available fail bit;

(b2) if such another available fail bit is found in (b1), then adding said another available fail bit to said cluster list, and jumping back to (b1); and

(b3) if no such another available fail bit is found in (b1), then completing said finding of said first set of available fail bits and resetting said flag associated with said available fail bit to indicate said second state.

13. The method according to claim 10, wherein (c) comprises:

(c1) checking said cluster list for a fail bit added thereto and having an associated flag that is set to indicate said first state;

(c2) if no such fail bit is found in (c1), then ending processing of said cluster list and jumping back to (a) to process another cluster list; and

(c3) if such fail bit is found in (c1), then indicating said fail bit as a current fail bit;

(c4) finding another available fail bit within said prespecified distance from said current fail bit;

(c5) if such another available fail bit is found in (c4), then adding said another available fail bit to said cluster list, and jumping back to (c4); and

(c5) if no such another available fail bit is found in (c4), then resetting said flag associated with said current fail bit to indicate said second state, and jumping back to (c1).

14. The method according to claim 1, wherein said bitmap is organized by X-Y coordinates, and said prespecified distance is measured by a square root of $[(X2-X1)^2+(Y2-Y1)^2]$, where X1 and Y1 are coordinates associated with said available fail bit and X2 and Y2 are coordinates associated with individual of said first set of available fail bits.

15. The method according to claim 1, wherein said bitmap is organized by X-Y coordinates, and said prespecified distance is measured by a sum of abs(X2-X1) and abs(Y2-Y1), where abs indicates absolute value, X1 and Y1 are coordinates associated with said available fail bit, and X2 and Y2 are coordinates associated with individual of said first set of available fail bits.

16. The method according to claim 1, wherein said bitmap is organized by X-Y coordinates, and said prespecified distance is measured by a larger or maximum of [abs(X2-X1), abs(Y2-Y1)], where abs indicates absolute value, X1 and Y1 are coordinates associated with said

available fail bit, and X2 and Y2 are coordinates associated with individual of said first set of available fail bits.

17. The method according to claim 1, wherein said first set of available fail bits and said additional sets of available fail bits are constrained to be within a same region of said bitmap as said available fail bit is found.

18. The method according to claim 17, wherein said same region is a half of said bitmap.

19. The method according to claim 17, wherein said same region is a quadrant of said bitmap.

20. An apparatus for identifying clusters of fail bits in a bitmap, comprising:

a memory storing fail bits in a bitmap; and

at least one circuit configured to

(a) find an available fail bit in said bitmap, generate a cluster list, and add said available fail bit to said cluster list;

(b) find a first set of available fail bits in said bitmap that are individually within a prespecified distance from said available fail bit, and add said first set of available fail bits to said cluster list; and

(c) find additional sets of available fail bits in said bitmap that are individually within said prespecified distance from individual of said first set of available fail bits or individual of said additional sets of available fail bits, and add said additional sets of available fail bits to

said cluster list so as to identify a cluster of fail bits in said bitmap.

21. The apparatus according to claim 20, wherein said at least one circuit is further configured to repeat functions (a) through (c) multiple times to identify multiple clusters of fail bits in said bitmap.

22. The apparatus according to claim 20, wherein said at least one circuit comprises a processor programmed to perform functions (a) through (c).

23. A computer readable media storing a program for identifying clusters of fail bits in a bitmap and adapted to interact with a processor to perform said program, wherein said program causes said processor to perform the functions of:

(a) finding an available fail bit in a bitmap, and adding said available fail bit to a cluster list;

(b) finding a first set of available fail bits individually within a prespecified distance from said available fail bit, and adding said first set of available fail bits to said cluster list; and

(c) finding additional sets of available fail bits individually within said prespecified distance from individual of said first set of available fail bits or individual of said additional sets of available fail bits, and adding said additional sets of available fail bits to said cluster list so as to identify a cluster of fail bits in said bitmap.